



National Aeronautics and  
Space Administration

## International Space Station Assembly Continues





After a period of intense construction, the International Space Station (ISS) has become a fully functioning laboratory in space.

On-orbit assembly began with the launch of the Russian-built Zarya control module on Nov. 20, 1998, from Kazakhstan. The 42,600-pound pressurized Zarya (or "Dawn" in English) control module provided the station's initial propulsion, power, attitude control, and communications.

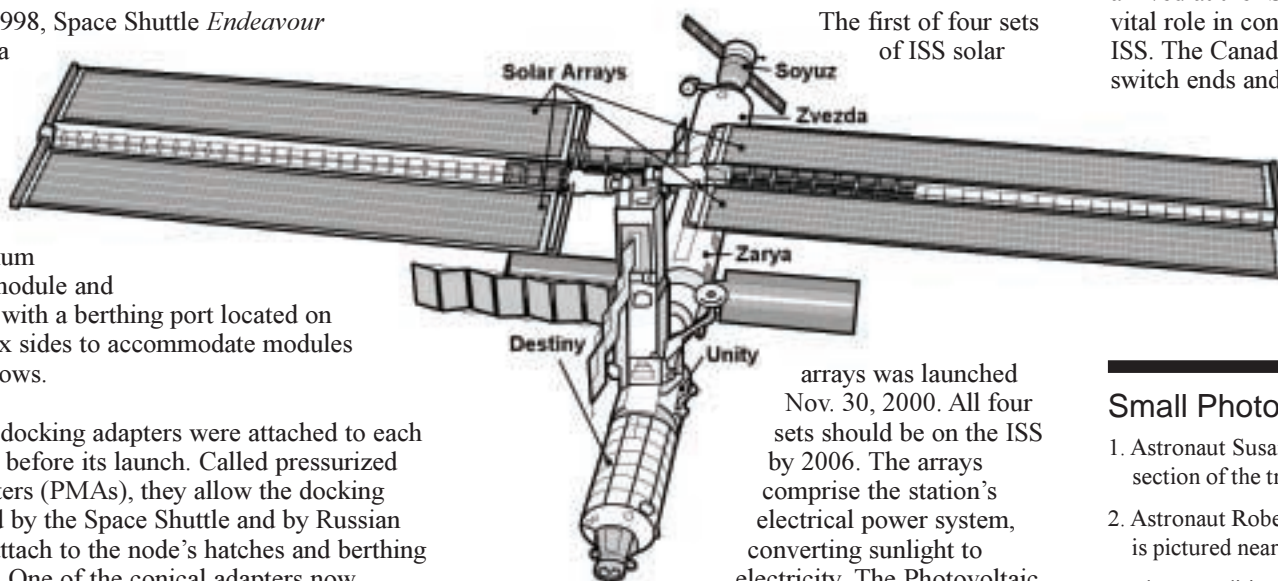
On Dec. 4, 1998, Space Shuttle *Endeavour* lifted off on a mission to connect the U.S. Unity module to Zarya. Unity is a six-sided aluminum connecting module and passageway, with a berthing port located on each of its six sides to accommodate modules as the ISS grows.

Two conical docking adapters were attached to each end of Unity before its launch. Called pressurized mating adapters (PMAs), they allow the docking systems used by the Space Shuttle and by Russian modules to attach to the node's hatches and berthing mechanisms. One of the conical adapters now permanently attaches Unity to Zarya, while the other provides a Shuttle docking port.

The third component is a central command and control post, known as the Zvezda Service Module. On July 12, 2000, Russia launched Zvezda (or "Star" in English). The Service Module provides living quarters for the crew, as well as life support systems, electrical power, computers and flight control

systems. Primary ISS control was then transferred from Zarya to Zvezda.

Launched on Oct. 11, 2000, the Z1 Integrated Truss Structure is part of the ISS's "backbone." The Z1 truss served as a mounting location for the first ISS solar arrays. These arrays provide power for the early science conducted on the ISS. This flight also delivered the third PMA and the Control Moment Gyros (providing nonpropulsive attitude control).



The first of four sets of ISS solar arrays was launched Nov. 30, 2000. All four sets should be on the ISS by 2006. The arrays comprise the station's electrical power system, converting sunlight to electricity. The Photovoltaic Power Module, or P6, performs this energy conversion. The P6 has four primary functions: to generate, store, regulate and distribute electrical power for the ISS.

The U.S. Destiny lab was launched to the station on Feb. 7, 2001. The workshop serves as the centerpiece of research and will eventually support experiments that could yield great benefits for

people on Earth. Scientists around the world will use ISS research results to enhance their studies in a variety of disciplines. Five systems racks in Destiny provide life-sustaining functions on board, including electrical power, cooling water, air revitalization, and temperature and humidity control. Additional research racks will be added on future missions. This vital lab is attached to the forward port of Unity.

The Candarm2, a next-generation robotic arm, arrived at the ISS on April 19, 2001. It will serve a vital role in construction and maintenance of the ISS. The Canadarm2 has the remarkable ability to switch ends and "inchworm" around the outside of the station. This allows the arm to perform work on the most complex and obscure details at virtually any point on the surface of the ISS. In the future, the arm will be able to travel up and down the truss as part of the Mobile Servicing System.

## Small Photos on Front:

1. Astronaut Susan Helms glides through the ISS with a section of the treadmill in hand.
2. Astronaut Robert L. Curbeam, STS-98 mission specialist, is pictured near Pressurized Mating Adapter-3 (PMA-3).
3. The Expedition One crew enjoys a snack on the wardroom table of the Zvezda service module on board the ISS.

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